

Name: _____

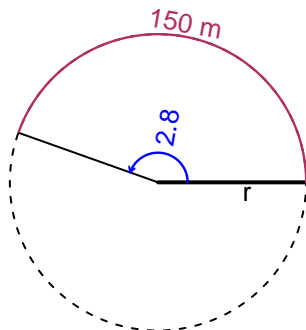
Date: _____

Trig Final (TEST v651)

- You can use a calculator (like [Desmos](#))
- You should have a unit-circle with special angles and coordinates marked.

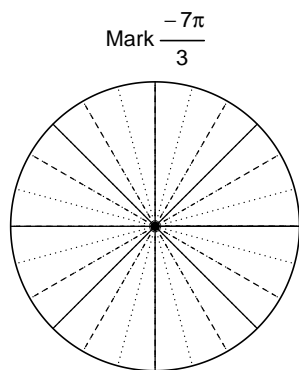
Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The angle measure is 2.8 radians. The arc length is 150 meters. How long is the radius in meters?

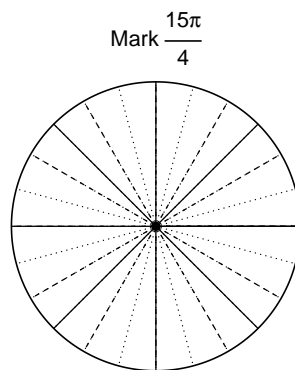


Question 2

Consider angles $-\frac{7\pi}{3}$ and $\frac{15\pi}{4}$. For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for $\cos\left(-\frac{7\pi}{3}\right)$ and $\sin\left(\frac{15\pi}{4}\right)$ by using a unit circle (provided separately).



Find $\cos(-7\pi/3)$



Find $\sin(15\pi/4)$

Question 3

If $\tan(\theta) = \frac{-21}{20}$, and θ is in quadrant IV, determine an exact value for $\sin(\theta)$.

Question 4

A mass-spring system oscillates vertically with a frequency of 8.53 Hz, an amplitude of 2.72 meters, and a midline at $y = 4.61$ meters. At $t = 0$, the mass is at the midline and moving up. Write an equation to model the height (y in meters) as a function of time (t in seconds).